

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings of claims in the application:

1. (Currently Amended) A method of producing 5-formyl-2-furylboronic acid, comprising:

a) ~~adding a base to a composition comprising a boric acid ester and 2-furaldehyde, thereby obtaining a reaction mixture and protecting~~ reacting the formyl group of said 2-furaldehyde with a protective group, to obtain a protected 2-furaldehyde;

b) adding a base to a composition comprising a boric acid ester and said protected 2-furaldehyde, thereby obtaining a reaction mixture and reacting said protected 2-furaldehyde, said base and said boric acid ester;

[[b]] c) ~~working up of adding~~ said reaction mixture [[in]] to an acidic medium[[,]];
and

[[c]] d) ~~isolating~~ obtaining 5-formyl-2-furylboronic acid from said acidic medium;
wherein said base is an alkyl metal, metal amide or mixtures thereof.

2. (Original) The method according to claim 1, wherein said boric acid ester is an alkyl boric acid ester, aryl boric acid ester or a mixture thereof.

3. (Original) The method according to claim 2, wherein said alkyl boric acid ester is selected from the group consisting of B(OiPr)₃, B(OEt)₃, B(OMe)₃, B(OPr)₃, B(Obu)₃, and mixtures thereof.

4. (Original) The method according to claim 1, wherein said protective group is a O,O-acetal protective group or N,O-acetal protective group.

5. (Original) The method according to claim 4, wherein said acetal protective group is selected from the group consisting of alkanols having 1 to 10 carbon atoms, alkandiol having 1 to 20 carbon atoms, and mixtures thereof.

6. (Canceled)

7. (Original) The method according to claim 1, wherein said base is selected from the group consisting of lithium hexamethyldisilazane, sodium hexamethyldisilazane, potassium hexamethyldisilazane, lithium diisopropylamide, butyl lithium, methyl lithium, ethyl lithium, propyl lithium, and mixtures thereof.

8. (Currently Amended) The method according to claim 1, wherein a solvent is present in step a);

wherein said solvent is selected from the group consisting of tetrahydrofuran, 1,2-dimethoxyethane, 1,4-dioxane, and mixtures thereof.

Claim 9 (Canceled)

10. (Original) The method according to claim 1, wherein said working-up is conducted by using an aqueous acid.

11. (Currently Amended) The method according to claim 10, wherein ~~sais~~ said aqueous acid is selected from the group consisting of hydrochloric acid, sulfuric acid, citric acid, acetic acid, formic acid, and mixtures thereof.

12. (Original) The method according to claim 10, wherein said isolating of 5-formyl-furan-boronic acid is carried out by filtration, centrifugation, crystallization or combinations thereof.

13. (Original) The method according to claim 1, further comprising recrystallizing 5-formyl-furan-boronic acid, thereby purifying said 5-formyl-furan-boronic acid.

14. (Original) The method according to claim 1, comprising:

a) adding lithium diisopropylamide to a composition comprising triisopropylborate and furfuraldiethylacetal, and optionally a solvent, thereby obtaining said reaction mixture, and

b) working-up of said reaction mixture in an acidic medium, and

c) isolating 5-formyl-2-furylboronic acid.

15. (Original) The method according to claim 1, wherein said protective group is selected from the group consisting of methanol, ethanol, propanol, butanol, ethylene glycol, 1,3-propane diol, and N-substituted ethanol amines.

16. (Currently Amended) The method according to claim [[6]] 1, wherein said alkyl metal is alkyl lithium, alkyl sodium or alkyl potassium.

17. (Original) The method according to claim 1, wherein said adding proceeds at a temperature of from -100°C to 30°C.

18. (Original) The method according to claim 1, wherein a ratio of said base to the protected 2-furaldehyde in step a) is from 1,0 to 1,6 equivalents of base per mole protected 2-furaldehyde.

19. (Original) The method according to claim 1, wherein a ratio of the boric acid ester to the protected 2-furaldehyde is from 1,0 to 1,8 moles of boric acid ester per mole of protected 2-furaldehyde.

20. (Original) The method according to claim 1, wherein said working-up is carried out at a temperature of from -10°C to 70°C.

21. (New) A method of producing 5-formyl-2-furylboronic acid, comprising:

a) reacting the formyl group of 2-furaldehyde with a protective group, to obtain a protected 2-furaldehyde;

b) adding a base to a composition comprising a boric acid ester and said protected 2-furaldehyde, thereby obtaining a reaction mixture and reacting said protected 2-furaldehyde, said base and said boric acid ester;

c) adding said reaction mixture to an acidic medium; and

d) obtaining 5-formyl-2-furylboronic acid from said acidic medium;

wherein said base is selected from the group consisting of lithium hexamethyldisilazane, sodium hexamethyldisilazane, potassium hexamethyldisilazane, lithium diisopropylamide, butyl lithium, methyl lithium, ethyl lithium, propyl lithium, and mixtures thereof.

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BASIS FOR THE AMENDMENT

Claims 6 and 9 have been canceled.

Claim 1 has been amended as supported at page 4, second paragraph of the specification.

New Claim 21 is supported by Claims 1 and 7 as originally filed.

No new matter is believed to have been added by entry of this amendment. Entry and favorable reconsideration are respectfully requested.

Upon entry of this amendment Claims 1-5, 7-8 and 10-21 will now be active in this application.

INTERVIEW SUMMARY

Applicants wish to thank Examiner Solola for the helpful and courteous discussion with Applicants' Representative on May 23, 2005. During this discussion it was noted that WO96/16046 is discussed in the specification at page 2, starting at line 3. The process of the reference has a low yield of 26%. In contrast, the process of the present invention has high yields of 75% and 90% as shown in the Examples. This is an improvement by a factor of at least 3. The order of adding the starting materials is a reason for this difference.

It was not obvious based on WO96/16046 to change the order of adding the starting materials.